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(54) **FAIR WEIGHTED QUEUING BANDWIDTH ALLOCATION SYSTEM FOR NETWORK SWITCH PORT**

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(57) **ABSTRACT**

A traffic manager for a network switch port stores incoming cells in a cell memory and later forwards them out of the cell memory and the switch port. Each cell is assigned to one of several flow queues and each flow queue has an assigned minimum forwarding bandwidth with which cells of that flow queue must be forwarded from the cell memory and has an assigned maximum bandwidth with which cells of that flow queue may be forwarded. When any flow queue is active (i.e., when it has cells currently stored in the cell memory), the traffic manager allocates a sufficient amount of the switch port's available cell forwarding bandwidth to each active flow queue so that cells of that flow queue are forwarded with at least the flow queue's assigned minimum bandwidth. Each flow queue also has an assigned forwarding weight, and the traffic manager also dynamically allocates a portion of the switch port's excess forwarding bandwidth, above that needed to accommodate each active flow queue's minimum bandwidth, among all active flow queues in relative proportion to each active flow queue's assigned forwarding weight. Thus the actual forwarding bandwidth allocated to each active flow queue is the sum of its assigned minimum forwarding bandwidth and its allocated portion of excess bandwidth. However the traffic manager limits the actual forwarding bandwidth allocated to any one flow queue so that it does not exceed the flow queue's assigned maximum forwarding bandwidth.

18 Claims, 7 Drawing Sheets